

WHAT IS CLAIMED IS:

1. A dry electrographic toner particle, comprising:  
an amphipathic copolymer,  
5 wherein the amphipathic copolymer comprises one or more S portions and one or more D portions.
2. The dry electrophotographic toner particle according to claim 1, further comprising a charge control additive.  
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3. The dry electrophotographic toner particle according to claim 2, wherein said charge control additive imparts a positive polarity to said toner particle.
4. The dry electrophotographic toner particle according to claim 1, further  
15 comprising at least one visual enhancement additive.
5. The dry electrophotographic according to claim 4, wherein said at least one visual enhancement additive is a pigment.
- 20 6. The dry electrophotographic toner particle according to claim 1, wherein said amphipathic copolymer has a glass transition temperature of between 0°C and 100°C.
7. The dry electrophotographic toner particle according to claim 6, wherein said S  
25 portion has a glass transition temperature calculated using the Fox equation of at least 0°C.
8. The dry electrophotographic toner particle according to claim 6, wherein said D  
30 portion has a glass transition temperature calculated using the Fox equation of between 60°C and 105°C.

9. The dry electrophotographic toner particle according to claim 1, wherein one or more of the S portions comprises a (meth)acrylic copolymer.
- 5 10. The dry electrophotographic toner particle according to claim 9, wherein the (meth)acrylic copolymer is derived from one or more polymerizable monomer(s) selected from the group consisting of alkylacrylates where the alkyl chain contains at least 10 carbon atoms and alkylmethacrylates where the alkyl chain contains at least 12 carbon atoms.
- 10 11. The dry electrophotographic toner particle according to claim 1, wherein one or more of the D portions comprises a (meth)acrylic copolymer.
12. The dry electrophotographic toner particle according to claim 11, wherein the (meth)acrylic copolymer is derived from one or more polymerizable monomer(s) selected from the group consisting of alkylacrylates where the alkyl chain contains fewer than 10 carbon atoms and alkylmethacrylates where the alkyl chain contains fewer than 12 carbon atoms.
- 15 13. The dry electrophotographic toner particle according to claim 9 or 11, wherein one or more S portions are chemically bonded to one or more of the D portions through a urethane linkage derived from dimethyl-m-isoprenyl benzyl isocyanate.
- 20 14. The dry electrophotographic toner particle according to claim 1 wherein the weight ratio of D portions to S portions is between 1/2 and 12/1.
- 25 15. The dry electrophotographic toner particle according to claim 1, wherein the S portion has a glass transition temperature calculated using the Fox equation (excluding grafting site components) of at least about 90°C.
- 30 16. The dry electrophotographic toner particle according to claim 1, wherein the S portion has a glass transition temperature calculated using the Fox equation

(excluding grafting site components) of from about 100°C to about 130°C.

17. The dry electrophotographic toner particle according to claim 1, wherein the S portion (excluding grafting site components) has a calculated Hildebrand solubility parameter of from about 16 MPa<sup>1/2</sup> to about 17.5 MPa<sup>1/2</sup>.
18. The dry electrophotographic toner particle according to claim 1, wherein at least about 75% of the S portion (excluding grafting site components) is derived from ingredients selected from the group consisting of trimethyl cyclohexyl methacrylate; t-butyl methacrylate; n-butyl methacrylate; isobornyl (meth)acrylate; 1,6-Hexanediol di(meth)acrylate and combinations thereof.
19. The dry electrophotographic toner particle according to claim 1, wherein at least about 90% of the S portion (excluding grafting site components) is derived from ingredients selected from the group consisting of trimethyl cyclohexyl methacrylate; t-butyl methacrylate; n-butyl methacrylate; isobornyl (meth)acrylate; 1,6-Hexanediol di(meth)acrylate and combinations thereof.
20. A method of making dry electrophotographic toner particles, comprising the steps of:
- a) providing an organosol comprising a plurality of binder particles dispersed in a liquid carrier, wherein the binder particles comprise at least one amphipathic copolymer; and
  - b) incorporating the binder particles into dry electrophotographic toner particles, said incorporating comprising drying one or more ingredients comprising the binder particles, said binder particles being in a fluidized state during at least a portion of said drying step.
21. The method of claim 20, wherein the incorporating step comprises causing the organosol to mixingly contact one or more ingredients comprising at least one colorant.

22. The method of claim 21, wherein the amphipathic copolymer comprises one or more S material portions and one or more D material portions.
- 5 23. The method of claim 21, wherein the liquid carrier comprises a hydrocarbon.
24. The method of claim 23, wherein the liquid carrier comprises an aliphatic hydrocarbon.
- 10 25. The method of claim 24, wherein the aliphatic hydrocarbon comprises heptane.
26. The method of claim 21, wherein the liquid carrier comprises an oleophilic solvent.
- 15 27. The method of claim 22, wherein the weight ratio of D material to S material is in the range of 2/1 to 10/1.
28. The method of claim 21, wherein the ingredients incorporated into the dry toner particles further comprise a charge directing agent.
- 20 29. The method of claim 21, wherein the dried binder particles are positively charged.
30. The method of claim 21, wherein the dried binder particles are negatively charged.
- 25 31. The method of claim 21, wherein the colorant comprises a pigment colorant.
32. The method of claim 21, wherein the D material has an effective Tg of greater than about 50°C.
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33. The method of claim 22, wherein each of the S and D materials is derived from ingredients comprising one or more free radically polymerizable monomers.
34. The method of claim 22, wherein the amphipathic copolymer has a graft structure comprising one or more D material portions grafted onto an S material portion.
35. The method of claim 22, wherein the S material is derived from ingredients comprising trimethyl cyclohexyl methacrylate.
36. The method of claim 22, wherein the S material is derived from ingredients comprising hydroxy ethylmethacrylate.
37. The method of claim 22, wherein the S material is derived from ingredients comprising octadecyl acrylate.
38. The method of claim 22, wherein the S material is derived from ingredients comprising dimethyl-m-isoprenyl benzyliocyanate.
39. The method of claim 22, wherein the S material has a glass transition temperature calculated using the Fox equation (excluding grafting site components) of at least about 90°C.
40. The method of claim 22, wherein the S material has a glass transition temperature calculated using the Fox equation (excluding grafting site components) of from about 100°C to about 130°C.
41. The method of claim 22, wherein the S material (excluding grafting site components) has a calculated Hildebrand solubility parameter of from about 16 MPa<sup>1/2</sup> to about 17.5 MPa<sup>1/2</sup>.
42. The method of claim 22, wherein at least about 75% of the S material (excluding

grafting site components) is derived from ingredients selected from the group consisting of trimethyl cyclohexyl methacrylate; t-butyl methacrylate; n-butyl methacrylate; isobornyl (meth)acrylate; 1,6-Hexanediol di(meth)acrylate and combinations thereof.

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43. The method of claim 22, wherein at least about 90% of the S material (excluding grafting site components) is derived from ingredients selected from the group consisting of trimethyl cyclohexyl methacrylate; t-butyl methacrylate; n-butyl methacrylate; isobornyl (meth)acrylate; 1,6-Hexanediol di(meth)acrylate and combinations thereof.

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44. The method of claim 22, wherein the D material is derived from ingredients comprising trimethyl cyclohexyl methacrylate.

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45. The method of claim 22, wherein the D material is derived from ingredients comprising ethyl methacrylate.

46. The method of claim 22, wherein the D material is derived from ingredients comprising styrene.

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47. The method of claim 22, wherein the D material is derived from ingredients comprising butyl methacrylate.

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48. The method of claim 22, wherein the absolute difference in Hildebrand solubility parameter between the S portion and the liquid carrier is from about  $2 \text{ MPa}^{1/2}$  to about  $3 \text{ MPa}^{1/2}$ .

49. A method of making dry electrographic toner particles, comprising the steps of:

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- a) providing an organosol comprising a plurality of binder particles dispersed in a liquid carrier; wherein said binder particles comprise at least one amphipathic copolymer; and
  - b) incorporating the binder particles into a plurality of dry electrophotographic toner particles.
50. A method of making electrophotographic toner particles, comprising the steps of:
- a) providing a plurality of free radically polymerizable monomers, wherein at least one of the monomers comprises hydroxyl functionality;
  - 10 b) free radically polymerizing the monomers in a solvent to form a hydroxyl functional polymer, wherein the monomers and the hydroxyl functional polymer are soluble in the solvent;
  - c) reacting a compound having NCO functionality and free radically polymerizable functionality with the hydroxyl functional polymer under conditions such that at least a portion of the NCO functionality of the compound reacts with at least a portion of the hydroxyl functionality of the polymer to form one or more urethane linkages by which the compound is linked to the polymer, thereby providing a polymer with pendant free radically polymerizable functionality;
  - 15 d) copolymerizing ingredients comprising (i) the polymer with pendant free radically polymerizable functionality, (ii) one or more free radically polymerizable monomers, and (iii) a liquid carrier in which polymeric material derived from ingredients comprising the one or more additional monomers is insoluble, said copolymerizing occurring under conditions effective to form an organosol comprising an amphipathic copolymer dispersed in the liquid carrier; and
  - 20 e) incorporating the amphipathic copolymer into dry electrophotographic toner particles.
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- 30 51. A dry electrophotographic toner particle comprising at least one visual enhancement particle and a polymeric binder derived from ingredients

comprising an amphipathic copolymer prepared according to the method of claim 50.

52. A method of electrophotographically forming an image on a substrate surface,  
5 comprising the steps of:
- a) providing a plurality of dry toner particles, said toner particles comprising a polymeric binder derived from ingredients comprising an amphipathic copolymer and optionally at least one visual enhancement particle ; and
  - b) causing an image comprising the toner particles to be formed on the  
10 substrate surface.
53. A method of electrophotographically forming an image on a substrate surface,  
comprising the steps of:
- a) providing a plurality of dry toner particles, said toner particles comprising  
15 at least one visual enhancement particle and a polymeric binder derived from ingredients comprising an amphipathic copolymer; and
  - b) causing an image comprising the toner particles to be formed on a charged surface; and
  - c) transferring the image from the charged surface to the substrate surface.

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